USMC Expeditionary Energy Concepts (E2C)

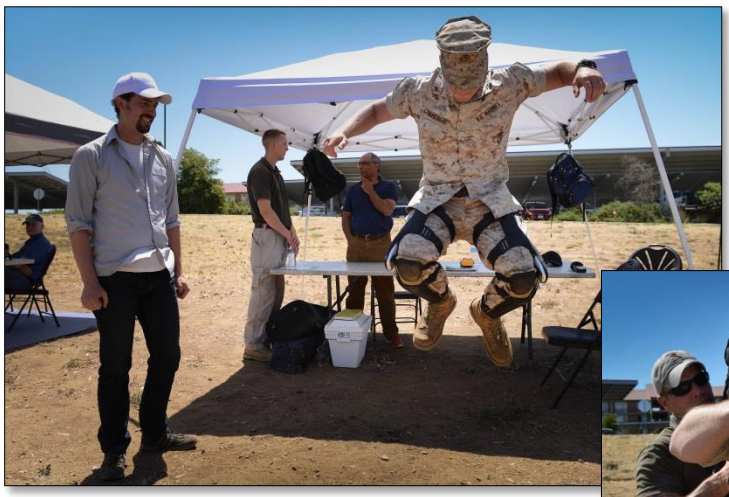
USMC E2C – *Accelerating Energy Innovation*:

- Expeditionary Energy Concepts (E2C) – formerly known as Experimental Forward Operating Base or ExFOB – is the Marine Corps' innovative process to identify and evaluate energy efficient technologies that can increase the self-sufficiency of expeditionary forces.
- Once a year, the Marine Corps invites industry to E2C to demonstrate commercial technologies with potential to address current Marine Corps energy, water, and waste capability gaps.
- Data gathered during E2C informs requirements and accelerates fielding of new systems that will increase Marines' combat effectiveness and reduce operational risk.

E2C 2015:

- *When*: 23-25 June 2015
- *Where*: Marine Corps Base Camp Lejeune, N.C.
- *Technology Focus Areas*:
  - Hybrid/Electric ATV
  - Batteries/Storage
  - Fuel Cells (≤10kW)
- Learn more at: www.hqmc.marines.mil/e2o

The first E2C technology demonstration (then known as ExFOB) in 2010 at MCB Quantico, Va.



A Marine tests a kinetic energy harvesting knee brace during the ExFOB 2014 technology demonstration.

A Marine prepares to test a kinetic energy harvesting backpack during the ExFOB 2014 technology demonstration.

About E2C:

- Created by the Commandant in 2009, E2C (formerly ExFOB) brings together stakeholders from across the Marine Corps requirements, acquisition, and technology development communities in a dynamic process to quickly evaluate and accelerate fielding of technologies that reduce battlefield energy and water requirements and extend the operational reach of the Marine Corps.
- E2C is not a tradeshow. During the week-long demonstration, a team of engineers will collect data on system performance and Marine operators will provide qualitative feedback on what they see. Following the demonstration, promising technologies may be evaluated in a controlled lab environment and then put into the hands of Marines for field testing in combat conditions. Lab and field evaluation results will inform Marine Corps requirements development and may lead to future fielding.
- Systems that make it through the five phases of E2C – from demonstration to fielding – can enable a more self-sufficient, combat-effective future force.

For More Information:

- U.S. Marine Corps Expeditionary Energy Office
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E2C Results "From Concept-to-Combat":

The Expeditionary Energy Concepts (E2C) team.

- **Since 2009, the Expeditionary Energy Concepts (E2C) team has:**
  - Conducted *7 demonstrations* at Marine Corps bases across the country
  - Reviewed *300+ technologies* through the E2C RFI process
  - Assessed *100+ technologies* at E2C demonstrations
  - Evaluated *26 systems* in lab / field following E2C
  - Transitioned *5 systems* to USMC Programs of Record

- **Five renewable energy systems first introduced by industry at past E2C technology demonstrations (formerly ExFOB) are currently Programs of Record:**

1) **Solar Portable Alternative Communications Energy System (SPACES):**
SPACES is a lightweight, portable, renewable energy system designed to provide power for platoon and squad size units operating in remote locations. Marines use SPACES to recharge batteries that power communications equipment like SATCOM radios, reducing the number of batteries carried on extended patrol.

2) **Ground Renewable Expeditionary Energy Network System (GREENS):**
GREENS is a portable power generation system that incorporates solar panels, energy storage, and AC/DC power sources. GREENS provides an average continuous output of 300 watts or 1,000 watts peak — enough to power a battalion combat operations center.

3) **Radiant Barrier:**
This shelter liner, designed for a Base-X 305 medium soft shelter, doubles the R-value (thermal resistance) of the tent. Marines use radiant barriers to keep cool air in and hot air out, reducing the number of environmental control units required in a combat environment.

4) **Light Emitting Diode (LED) Lights:**
LED light sets for medium soft shelters and general purpose use are more efficient than traditional fluorescent lights. Marines light their tents with these systems in order to keep power requirements at a minimum.

5) **Mobile Electric Hybrid Power Sources (MEHPS):**
MEHPS power generation—combining batteries, solar, and smart controls with traditional diesel generators—has demonstrated up to 50% fuel savings and up to 80% reduced generator run time. The Marine Corps is working closely with the Army to develop joint requirements for and field hybrid power systems that will increase the combat effectiveness of both services.